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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,884	12/08/2003	Kia Silverbrook	MTB06US	9643

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SILVERBROOK RESEARCH PTY LTD
393 DARLING STREET
BALMAIN, NSW 2041
AUSTRALIA

EXAMINER	
HSIEH, SHIH WEN	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/728,884	SILVERBROOK, KIA	
	Examiner	Art Unit	
	Shih-wen Hsieh	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12-16-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 10 and 29 are objected to because of the following informalities:

In regard to:

Claims 10 and 29:

Line 2, please change "areal" into "area".

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-4 and 19-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 8 and 19 of copending Application No. 10/728,806 respectively. Although the conflicting claims are not identical, they are not patentably distinct from each other because both case deal with how a bubble is formed in an ink jet printer.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Below is a table of comparison between claims to indicate their obviousness:

10/728,884	**10/728,806**
1. An inkjet printhead comprising: a plurality of nozzles, each defining an ejection aperture; a bubble forming chamber corresponding to each of the nozzles respectively, the bubble forming chamber adapted to contain a bubble forming liquid; and, at least one heater element disposed in each of the bubble forming chambers respectively, the heater elements configured for thermal contact with the bubble forming liquid; such that, the heater element can be heated to a temperature above the boiling point of the bubble forming liquid to form a gas bubble that causes the ejection of a drop of an ejectable liquid through the ejection aperture; and, the gas bubble collapsing to a collapse point after the heater element has been heated to a temperature above the boiling point of the bubble forming liquid; wherein, the collapse point of the	**1**. An ink jet printhead comprising: a plurality of nozzles, at least one heater element corresponding to each of the nozzles respectively, the heater element configured for thermal contact with a bubble forming liquid; such that, heating the heater element to a temperature above the boiling point of the bubble forming liquid forms a gas bubble that causes the ejection of a drop of an ejectable liquid through the nozzle corresponding to that heater element; wherein, the heater element requires less than 8 volts and a current of less than 60 milliamps for less than 1.5 microseconds, in order to form the gas bubble that causes the ejection of the drop of ejectable liquid. **8**. The printhead of claim 1 wherein each of the nozzles defines an ejection aperture positioned less than 50 microns from the ejection aperture.

gas bubble is less than 50 microns from the ejection aperture. **2**. The printhead of claim 1 wherein the collapse point of the gas bubble is less than 25 microns from the ejection aperture. **3**. The printhead of claim 1 wherein the collapse point of the gas bubble is less than 10 microns from the ejection aperture. **4**. The printhead of claim 1 wherein the collapse point of the gas bubble is less than 5 microns from the ejection aperture. **19**. A printer system which incorporates a printhead, the printhead comprising: a plurality of nozzles, each defining an ejection aperture; a bubble forming chamber corresponding to each of the nozzles respectively, the bubble forming chambers adapted to contain a bubble forming liquid; and, at least one heater element disposed in each of the bubble forming chambers respectively, the heater elements configured for thermal contact with the bubble forming liquid; such that, the heater element can be heated to a temperature above the boiling point of the bubble forming liquid to form a gas bubble that causes the ejection of a drop of an ejectable liquid through the ejection aperture; and the gas bubble collapsing to a collapse point after the heater element has been heated to a temperature above the boiling point of the bubble forming liquid; wherein, the collapse point of the gas bubble is less than 50 microns from the ejection aperture. **20**. The system of claim 19 wherein the collapse point of the gas bubble is less than 25 microns frm the ejection aperture. **21**. The system of claim 19 wherein the collapse point of the gas bubble is less than 10 microns from the ejection aperture.	**19**. A printer system which incorporates a printhead, the printhead comprising: a plurality of nozzles, at least one heater element corresponding to each of the nozzles respectively, the heater element configured for thermal contact with a bubble forming liquid; such that, heating the heater element to a temperature above the boiling point of the bubble forming liquid forms a gas bubble that causes the ejection of a drop of an ejectable liquid through the nozzle corresponding to that heater element; wherein, the heater element requires less than 8 volts and a current of less than 60 milliamps for less than 1.5 microseconds, in order to form the gas bubble that causes the ejection of the drop of ejectable liquid.

22. The system of claim 19 wherein the collapse point of the gas bubble is less than 5 microns from the ejection aperture.	

In regard to:

Claims 1-4:

Nozzles, heater elements and limitations are the same as those in co-pending application. These can be seen from the table provided above.

The differences are:

1. a bubble forming chamber being specified in the instant application.

A bubble forming chamber, sometimes called a pressure chamber, is an essential part in an ink jet printer, where ink in the chamber suffers phase change by a heater or volume change by a piezoelectric material so as to shoot ink out of the nozzle in the form of ink droplet. Therefore, even it is not mentioned in the claims, the bubble forming chamber is obviously contained in the head portion of the ink jet printer.

2. the collapse point of the bubble, and the point is less than 50 microns from the ejection aperture.

Before addressing to this issue, a general structure of the nozzle is discussed first. The nozzle has an opening located at its tip end, ink is existed from this opening as an ink droplet. Tracing back from this tip opening toward the internal of the nozzle is the bubble forming chamber, ink channel, common ink chamber, etc. The heater is place in the bubble forming chamber portion, therefore, the bubble is formed around the heater and is at a distance away from the nozzle opening located at the nozzle tip end.

Knowing this, then the forming of a bubble and its collapsing is occurred around the heater area. This collapsing provides propulsive force to send the ink out of the nozzle in the form of a droplet. This phenomena as described in language is the formation of the bubble and its collapsing is at how many microns **within** the nozzle. Therefore, all of the numbers in microns in claims 1-4 are the appropriate distance.

Claims 19-22:

The discussions of the obviousness of claims 19-22 over claim 10 of co-pending application is the same as those discussed for claims 1-4 above.

4. Claims 6-18 and 25-37 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 8 and 19 of copending Application No. 10/728,806 in view of Silverbrook (US pat. No. 6,755,509) respectively. Instant application is a CIP of 10/302,274 (patent no. 6,755,509), which was filed on Nov. 23, 2002. Claims in this application, which are related to continuation in part, such as claims 1, 19, 38, etc. tabulated in page 3, co-pending application 10/728,806 (filed on 12-8-2003) is used. For claims other than claims 1, 19 and 38, etc. in the instant application, patent 6,755,509, filed on Nov. 23, 2002 is used. Or, claims 1-4, 19-22 and 38-41 are double-patented against co-pending application 10/728,806. Rest of the claims are double patented against patent 6,755,509.

This is a provisional obviousness-type double patenting rejection.

10/728,884	**10/728,806/6,755,509**

6. The printhead of claim 1 being configured to print on a page and to be a page-width printhead.	**2.** The printhead of claim 1 being configured to print on a page and to be a page-width printhead.
7. The printhead of claim 1 wherein each heater element is in the form of a cantilever beam.	**3**. The printhead of claim 1 wherein each heater element is in the form of a cantilever beam.
8. The printhead of claim 1 wherein each heater element is configured such that an actuation energy of less than 500 nanojoules (nJ) is required to be applied to that heater element to heat that heater element sufficiently to form a said bubble in the bubble forming liquid thereby to cause the ejection of a said drop.	**4**. The printhead of claim 1 wherein each heater element is configured such that an actuation energy of less than 500 nanojoules (nJ) is required to be applied to that heater element to heat that heater element sufficiently to form a said bubble in the bubble forming liquid thereby to cause the ejection of a said drop.
9. The printhead of claim 1 configured to receive a supply of the ejectable liquid at an ambient temperature, wherein each heater element is configured such that the energy required to be applied thereto to heat said part to cause the ejection of a said drop is less than the energy required to heat a volume of said ejectable liquid equal to the volume of the said drop, from a temperature equal to said ambient temperature to said boiling point.	**5**. The printhead of claim 1 configured to receive a supply of the bubble forming liquid at an ambient temperature, wherein each heater element is configured such that the energy required to be applied thereto to heat said part to cause the ejection of a said drop is less than the energy required to heat a volume of said bubble forming liquid equal to the volume of the said drop, from a temperature equal to said ambient temperature to said boiling point.
10. The printhead of claim 1 comprising a substrate having a substrate surface, wherein the area density of the nozzles relative to the substrate surface exceeds 10,000 nozzles per square cm of substrate surface.	**6**. The printhead of claim 1 comprising a substrate having a substrate surface, wherein each nozzle has a nozzle aperture opening through the substrate surface, and wherein the area density of the nozzles relative to the substrate surface exceeds 10,000 nozzles per square cm of substrate surface.
11. The printhead of claim 1 wherein each heater element has two opposite sides and is configured such that a said gas bubble formed by that heater element is formed at both of said sides of that heater element.	**7**. The printhead of claim 1 wherein each heater element has two opposite sides and is configured such that a said gas bubble formed by that heater element is formed at both of said sides of that heater element.
12. The printhead of claim 1 wherein the bubble which each element is configured to form is collapsible and has a point of collapse, and wherein each heater	**8**. The printhead of claim 1 wherein the bubble which each element is configured to form is collapsible and has a point of collapse, and wherein each heater

element is configured such that the point of collapse of a bubble formed thereby is spaced from that heater element.	element is configured such that the point of collapse of a bubble formed thereby is spaced from that heater element.
13. The printhead of claim 1 comprising a structure that is formed by chemical vapor deposition (CVD), the nozzles being incorporated on the structure.	**9**. The printhead of claim 1 comprising a structure that is formed by chemical vapor deposition (CVD), the nozzles being incorporated on the structure.
14. The printhead of claim 1 comprising a structure which is less than 10 microns thick, the nozzles being incorporated on the structure.	**10**. The printhead of claim 1 comprising a structure which is less than 10 microns thick, the nozzles being incorporated on the structure.
15. The printhead of claim 1 comprising a plurality of nozzle chambers each corresponding to a respective nozzle, and a plurality of said heater elements being disposed within each chamber, the heater elements within each chamber being formed on different respective layers to one another.	**11**. The printhead of claim 1 comprising a plurality of nozzle chambers each corresponding to a respective nozzle, and a plurality of said heater elements being disposed within each chamber, the heater elements within each chamber being formed on different respective layers to one another.
16. The pripthead pf claim 1 wherein each heater element is formed of solid. Material more than 90% of which, by atomic proportion, is constituted by at least one periodic element having an atomic number below 50.	**12**. The printhead of claim 1 wherein each heater element is formed of solid material more than 90% of which, by atomic proportion, is constituted by at least one periodic element having an atomic number below 50.
17. The printhead of claim 1 wherein each heater element includes solid material and is configured for a mass of less than 10 nanogrnms of the solid material of that heater element to be heated to a temperature above said boiling point thereby to heat said part of the bubble forming liquid to a temperature above said boiling point to cause the ejection of a said drop.	**13**. The printhead of claim 1 wherein each heater element includes solid material and is configured for a mass of less than 10 nanograms of the solid material of that heater element to be heated to a temperature above said boiling point thereby to heat said part of the bubble forming liquid to a temperature above said boiling point to cause the ejection of a said drop.
18. The printhead of claim 1 wherein each heater element is substantially covered by a conformal protective coating, the coating of each heater element having been applied substantially to all sides of the heater element simultaneously such that the coating is seamless.	**14**. The printhead of claim 1 wherein each heater element is covered by a conformal protective coating, the coating of each heater element having been applied to all sides of the heater element simultaneously such that the coat is seamless.
25. The system of claim 19 being configured to print on a page and to be a	**16**. The system of claim 15 being configured to print on a page and to be a

page-width printhead. **26**. The system of claim 19 wherein each heater element is in the form of a cantilever beam. **27**. The system of claim 19 wherein each heater element is configured such that an actuation energy of less than 500 nanojoules (nJ) is required to be applied to that heater element to heat that heater element sufficiently to form a said bubble in the bubble forming liquid thereby to cause the ejection of a said drop. **28**. The system of claim 19, wherein the printhead is configured to receive a supply of the ejectable liquid at an ambient temperature, and wherein each heater element is configured such that the energy required to be applied thereto to heat said part to cause the ejection of a said drop is less than the energy required to heat a volume of said ejectable liquid equal to the volume of the said drop, from a temperature equal to said ambient temperature to said boiling point. **29**. The system of claim 19 comprising a substrate having a substrate surface, wherein the area density of the nozzles relative to the substrate surface exceeds 10,000 nozzles per square cm of substrate surface. **30**. The system of claim 19 wherein each heater element has two opposite sides and is configured such that a said gas bubble formed by that heater element is formed at both of said sides of that heater element. **31**. The system of claim 19 wherein the bubble which each element is configured to form is collapsible and has a point of collapse, and wherein each heater element is configured such that the point of collapse of a bubble formed thereby is spaced from that heater element.	page-width printhead. **17**. The system of claim 15 wherein each heater element is in the form of a cantilever beam. **18**. The system of claim 15 wherein each heater element is configured such that an actuation energy of less than 500 joules (nJ) is required to be applied to that heater element to heat that heater element sufficiently to form a said bubble in the bubble forming liquid thereby to cause the ejection of a said drop. **19**. The system of claim 15, wherein the printhead is configured to receive a supply of the bubble forming liquid at an ambient temperature, and wherein each heater element is configured such that the energy required to be applied thereto to heat said part to cause the ejection of a said drop is less than the energy required to heat a volume of said bubble forming liquid equal to the volume of the said drop, from a temperature equal to said ambient temperature to said boiling point. **20**. The system of claim 15 comprising a substrate having a substrate surface, wherein each nozzle has a nozzle aperture opening through the substrate surface, and wherein the area density of the nozzles relative to the substrate surface exceeds 10,000 nozzles per square cm of substrate surface. **21**. The system of claim 15 wherein each heater element has two opposite sides and is configured such that a said gas bubble formed by that heater element is formed at both of said sides of that heater element. **22**. The system of claim 15 wherein the bubble which each element is configured to form is collapsible and has a point of collapse, and wherein each heater element is configured such that the point of collapse of a bubble formed thereby is spaced from that heater element.

32. The system of claim 19 comprising a structure that is formed by chemical vapor deposition (CVD), the nozzles being incorporated on the structure.	**23**. The system of claim 15 comprising a structure that is formed by chemical vapor deposition (CVD), the nozzles being incorporated on the structure.
33. The system of claim 19 comprising a structure which is less than 10 microns thick, the nozzles being incorporated on the structure.	**24**. The system of claim 15 comprising a structure which is less than 10 microns thick, the nozzles being incorporated on the structure.
34. The system of claim 19 comprising a plurality of nozzle chambers each corresponding to a respective nozzle, and a plurality of said heater elements being disposed within each chamber, the heater elements within each chamber being formed on different respective layers to one another.	25. The system of claim 15 comprising a plurality of nozzle chambers each corresponding to a respective nozzle, and a plurality of said heater elements being disposed within each chamber, the heaterelements within each chamber being formed on different respective layers to one another.
35. The system of claim 19 wherein each heater element is formed of solid material more than 90% of which, by atomic proportion, is constituted by at least one periodic element having an atomic number below 50.	**26**. The system of claim 15 wherein each heater element is formed of solid material more than 90% of which, by atomic proportion, is constituted by at least one periodic element having an atomic number below 50.
36.The system of claim 19 wherein each heater element includes solid material and is configured for a mass of less than 10 nanograms of the solid material of that heater element to be heated to a temperature above said boiling point thereby to heat said part of the bubble forming liquid to a temperature above said boiling point to cause the ejection of a said drop.	**27**. The system of claim 15 wherein each heater element includes solid material and is configured for a mass of less than 10 nanograms of the solid material of that heater element to be heated to a temperature above said boiling point thereby to heat said part of the bubble forming liquid to a temperature above said boiling point to cause the ejection of a said drop.
37. The system of claim 19 wherein each heater element is substantially covered by a conformal protective coating, the coating of each heater element having been applied substantially to all sides of the heater element simultaneously such that the coating is seamless.	**28**. The system of claim 15 wherein each heater element is covered by a conformal protective coating, the coating of each heater element having been applied to all sides of the heater element simultaneously such that the coating is seamless.

The obviousness of claims in the instant application over those in patent 6,755,509 is clear and self-explanatory as can be seen by the table above.

5. Each of the **method claims 38-54** corresponds to each of the apparatus claims in either claims 1-18 or claims 19-37 discussed in paragraphs 3 and 4 above, and the non-statutory double patenting rejection for claims 38-41 and 43-54 are not discussed in this office action for saving papers and time.

The steps in the method claims are deemed to be made obvious by the structure in the combination discussed above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 5, 23, 24, 42 and 43 are rejected under 35 U.S.C. 103(a) as being obvious over Silverbrook (US 2004/0100532).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject

matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2). The bubble forming liquid and the ejectable liquid are of a common body of liquid, etc. are discussed.

In regard to:

Claim 5:

The device of Silverbrook (2004/0100532=10/728,806) DIFFERS from claim 5 in that it does not teach:

wherein the bubble forming liquid and the ejectable liquid are of a common body of liquid.

Since only one type of liquid is existed in the bubble forming chamber, Therefore it would have been an obvious matter that the liquid, with which a bubble is going to be formed and shooting out of the nozzle as an droplet is the ejectable liquid.

Claim 23:

The device of Silverbrook (2004/0100532=10/728,806) DIFFERS from claim 23 in that it does not teach:

The system of claim 19 being configured to support the bubble forming liquid in thermal contact with each said heater element, and to support the ejectable liquid adjacent each nozzle.

The recitation above is merely a statement of a print head having nozzles, which have nozzle chambers storing ejectable liquid, the nozzle chambers are the bubble forming chambers, because bubbles are formed in here, for a bubble jet printer, heater is used, and the heaters are disposed in the chambers respectively. Therefore it would have been an obvious matter that the system, specifically, the ink jet printer, have nozzles, and the liquid inside the nozzle is kind of supported by the nozzles.

Claim 24:

The system of claim 19 wherein the bubble forming liquid and the ejectable liquid are of a common body of liquid.

Rejection:

This claim is rejected on the basis as set forth for claim 5 discussed above.

Claim 42:

The method of claim 38 wherein the bubble forming liquid and the ejectable liquid are of a common body of liquid.

Rejection:

This claim is rejected on the basis as set forth for claim 5 discussed above.

Claim 43:

The device of Silverbrook DIUFFERS from claim 43 in that it does not teach:

wherein the bubble forming liquid is fed to the at least one heater element so that it substantially surrounds the heater element.

In an ink jet printer, which uses heater to heat up a liquid to cause a phenomena called film boiling is a basic characteristics of the printer.

Therefore it would have been an obvious matter that in order to cause film boiling situation the liquid contained in the nozzle chamber or bubble forming chamber has to be in contact with the heater in a certain way such that the heat generated by the heater is transmitted to the liquid, which surrounds the heater causing film boiling or phase change, i.e., ink is changed from a liquid state to a gas state, and in the form of a bubble. That is why an ink jet printer is also called a bubble jet printer.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-wen Hsieh whose telephone number is 571-272-2256. The examiner can normally be reached on 7:30AM -5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, S D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SHIH-WEN HSIEH
PRIMARY EXAMINER

Shih-wen Hsieh
Primary Examiner
Art Unit 2861

SWH
Jan 11, 2006